FMP - J & L Steel
Attachment A-2

4.0 HYDROLOGY

4.1 TOPOGRAPHY

Hennepin Works is located in northern Putnam County, physiographically in the Bloomington Ridge Plain of the Central Lowland Province. The local topography is characteristic of Wisconsin glaciation and has been influenced by the dissection of the land surface by the nearby Illinois River. River drainage is primarily to the southwest, towards the Mississippi River. Locally, the elevation ranges from low areas at 450' above mean sea level to river terraces at 696' above mean sea level as illustrated in topographic map, Figure 4.0-1.

4.2 REGIONAL HYDROLOGY

The information utilized in describing the regional hydrology for the study area was obtained from the State of IEPA publication; "Aquifers of Illinois: Underground Sources of Drinking Water (USDW) and Non-Drinking Water", September, 1981 and Illinois State Water Survey Bulletin 60-18, "Public Groundwater Supplies in Putnam County", 1976.

The primary public water supply in Putnam County and vicinity is supplied by two major aquifer systems; the Quaternary and Pennsylvania aquifers. These aquifer systems are described in detail below:

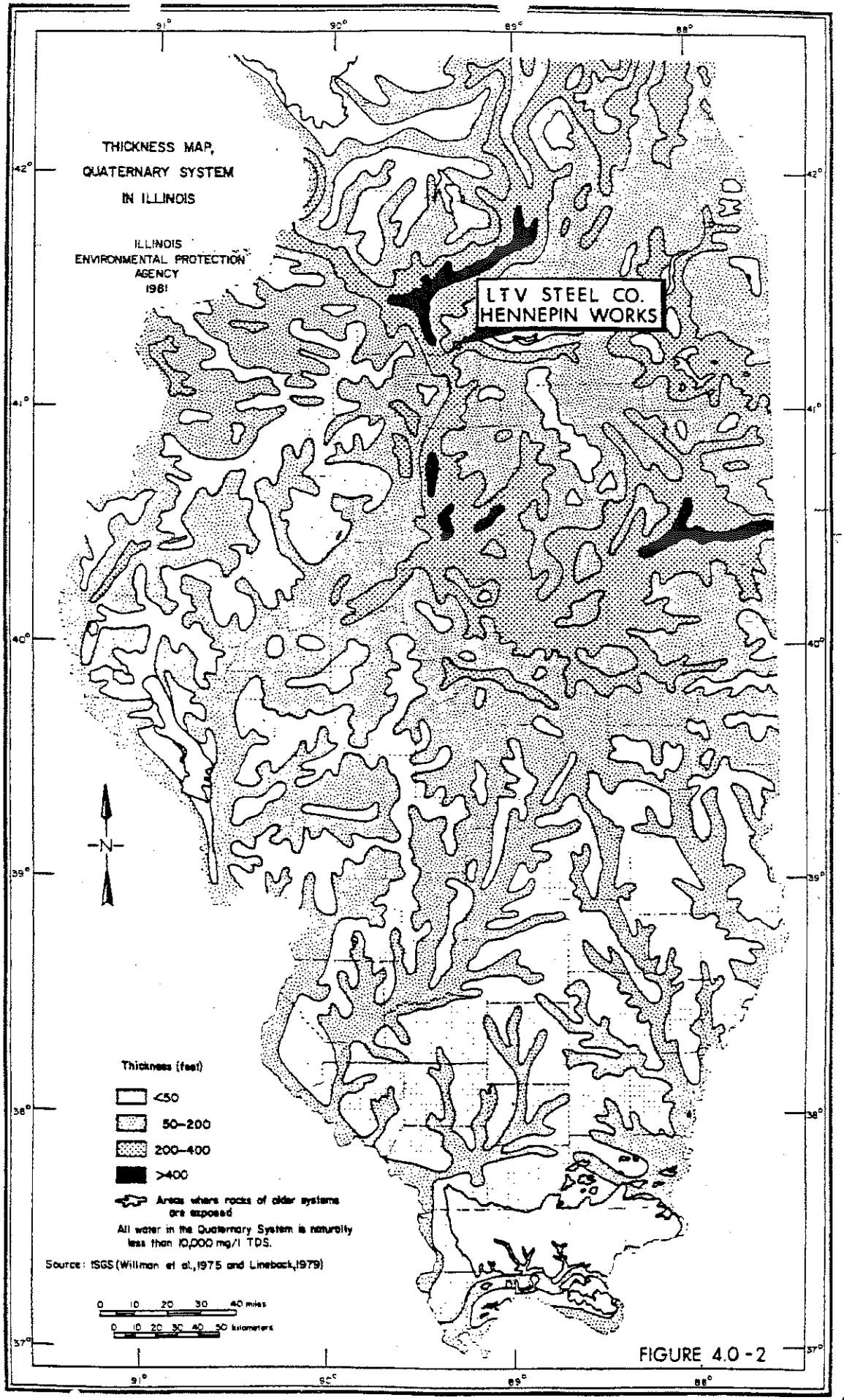
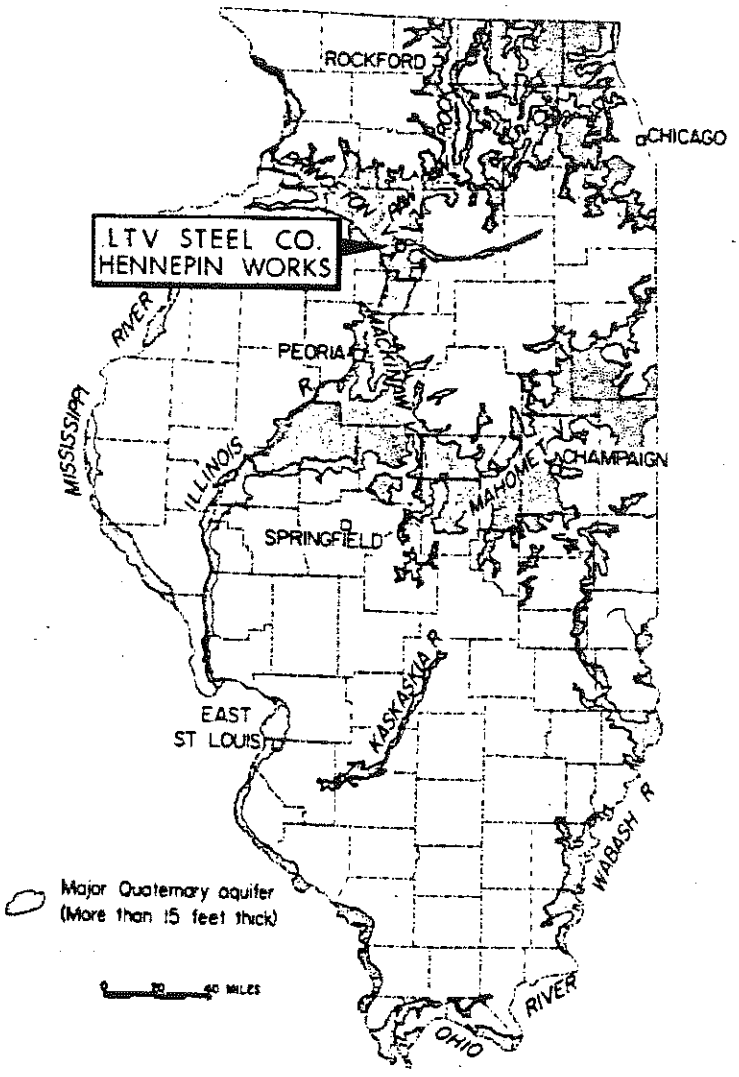

THICKNESS MAP,
QUATERNARY SYSTEM
IN ILLINOIS
ILLINOIS
ENVIRONMENTAL PROTECTION
AGENCY
1981
LTV STEEL CO.
HENNEPIN WORKS
91°
90°
89°
88°
42°
41°
40°
39°
38°
37°
N
Thickness (feet)
<50
50–200
200–400
>400
Areas where rocks of older systems are exposed
All water in the Quaternary System is naturally less than 10,000 mg/l TDS.
Source: ISGS (Willman et al., 1975 and Lineback, 1979)
0 10 20 30 40 miles
0 10 20 30 40 50 kilometers

FIGURE 4.0-2



Major Quaternary Aquifers in Illinois
(modified from Bergstrom et al., 1968).

FIGURE 4.0-3

Devonian - Silurian Aquifers - The Devonian - Silurian limestone and dolomite sequences are not widely utilized as aquifers because they yield highly mineralized water in low to moderate quantities. The village of Hennepin obtains its ground water supply from limestone at depths up to 135'.

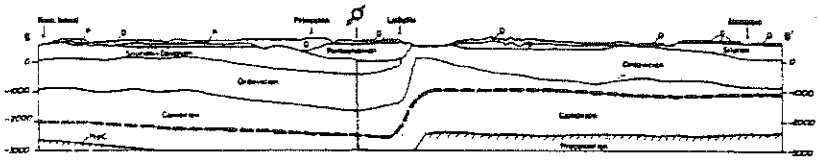
Ordovician Aquifers - Ordovician aquifers present within the study area consist in descending order of the Galena - Platterville Dolomite Groups, Glenwood - St. Peter Sandstone, Shakopee Dolomite, New Richmond Sandstone and Oreota Dolomite. Only a few water wells in Putnam County have penetrated into the Glenwood - St. Peter Sandstone which yields moderate quantities of mineralized water.

Underground Sources of Drinking Water (USDW) - A USDW is any aquifer which is potentially capable of yielding usable quantities of ground water (defined as having a TDS content less than 10,000 mg/L). Figure 4.0-4 illustrates the TDS content of ground water of aquifers in Illinois in cross section form. Figure 4.0-5 provides a description of the hydrogeologic role of all major aquifers in Illinois.

GEOLOGIC CROSS SECTIONS
AND
THE TDS CONTENT OF GROUND WATER
IN
ILLINOIS

ILLINOIS
ENVIRONMENTAL PROTECTION
AGENCY
1981

HENNEPIN WORKS



B-B' EAST-WEST CROSS SECTION ROCK ISLAND TO MOMENCE

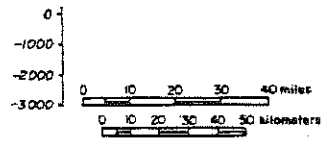
LEGEND

Approximate boundary of 10,000 mg/l TDS.

Area where water contains more than 10,000 mg/l TDS

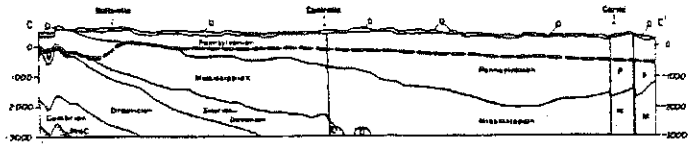
ABBREVIATIONS

D	Devonian
K	Cretaceous
M	Mississippian
P	Pennsylvanian
PreC	Precambrian
Q	Quaternary
S	Silurian
T	Tertiary
TDS	total dissolved solids

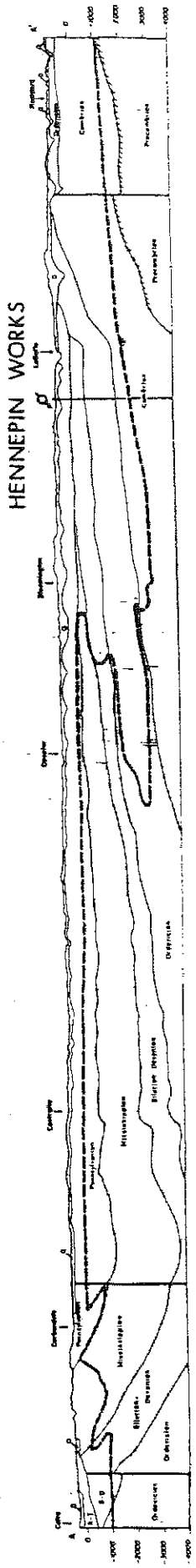


Elevation in feet and referenced to mean sea level

Source: Modified from Willman et al., 1967.
TDS by Brower, 1980.



C-C' EAST-WEST CROSS SECTION BELLEVILLE TO CARMI



A-A' NORTH-SOUTH CROSS SECTION CAIRO TO ROCKFORD

FIGURE 4.0-4

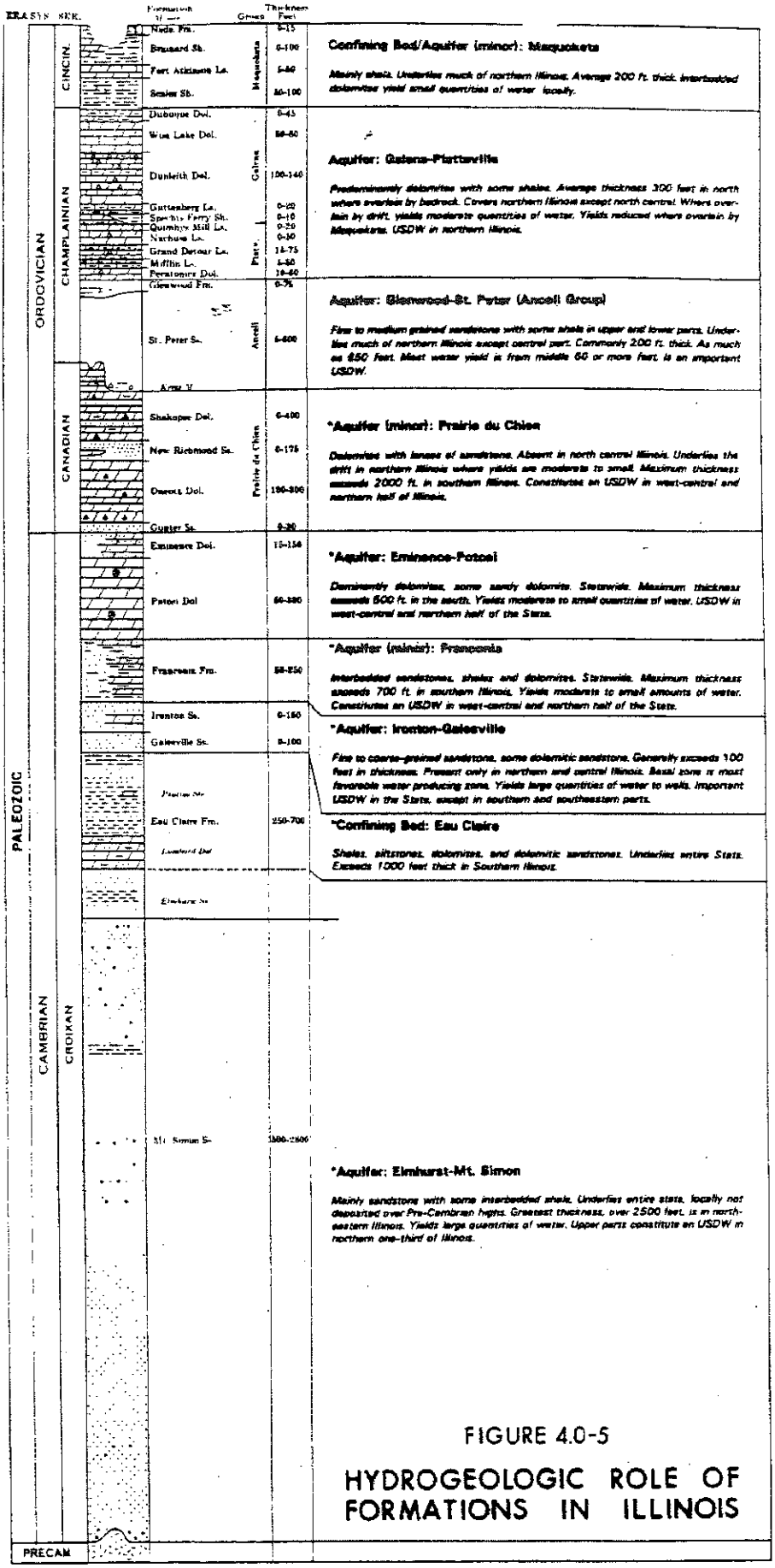


FIGURE 4.0-5

HYDROGEOLOGIC ROLE OF FORMATIONS IN ILLINOIS

(STUDENT, 1981)

*Description of hydrogeologic role is applicable over entire State.

4.3 LOCAL HYDROLOGY

There are no active water wells within the Hennepin plant site nor within 1/4 mile of the injection well. The Hennepin Pubic Water District (HPWD) currently services the Hennepin Works. Unconsolidated sand and gravel deposited within the Illinois River Valley and the ancestral Mississippi Valley form the aquifer system supplying ground water to the HPWD. These sand and gravel deposits yield large quantities of water. Three water wells are presently in active use by the HPWD. Total municipal pumpage in HPWD as of October 1984 was 144,500 gallons per day (gpd).

A water well investigation was performed and a file search conducted at both the State of Illinois Geological Survey and Illinois State Water Survey. Six water wells are in active use by tenant farmers occupying property owned by J & L Steel, adjacent to the Hennepin Works plant site. In addition, 17 other water wells were located within the area of review. All are greater than 1/4 mile from the injection well and of the total of 23 wells described, only nine are in use. Pertinent well information is listed in Table 4.0-1 and a water well inventory with additional information is included as Appendix 4.0-A. Available information indicates that these wells are all less than 300' in depth. Figure 4.0-1 depicts water well locations with respect to Hennepin's waste disposal well.

TABLE 4.0-1
WATER WELL INVENTORY
Hennepin Public Water District

Well Name	Date Completed	Status
HPWD 1	1910	Plugged
HPWD 2	1951	Plugged
HPWD 3	1955	*In Use
HPWD 4	1959	*In Use
HPWD 5	1967	*In Use
Unknown	1941	Plugged
Peterson	-	**Active
Morine	1924	**Active
Byczynski	1904	**Active
Dore	1922	Unknown
Hamm	1895	**Active
Unknown	-	**Active
Unknown	1966	**Active
831	1966	Unknown
808	1966	Unknown
Anderson	1904	Unknown
Henning	1904	Unknown
O'Conner	1928	Unknown
Fassino	1925	Unknown
Holmes	1978	Unknown
Maulfair	1975	Unknown
Richard	1975	Unknown
Bonges	1909	Unknown
Kaplan	1968	Unknown
Skutt	1966	Unknown
Ripsch	1977	Unknown
Eaton	1968	Unknown

*In use by the Hennepin Public Water District (HPWD).
**In active use by tenant farmers on J & L property adjacent to the Hennepin plant site.

4.4 STATIC WATER LEVEL AND PIEZOMETRIC (POTENTIOMETRIC SURFACE) MAP

The most recent static water level measurement was obtained from HPWD well No. 3 in 1969. The water level was reported at 59' below the ground surface with a surface elevation of 503'.

According to the Illinois State Water Survey (Communication, 1984) no piezometric maps have been generated for the Hennepin Works study area because of the historic sparcity of water level information. Due to a lack of localized recent water level information, it was not possible to develop a piezometric map for the UIC permit study area. A recent chemical analysis of ground water is included Appendix 4.0-A.

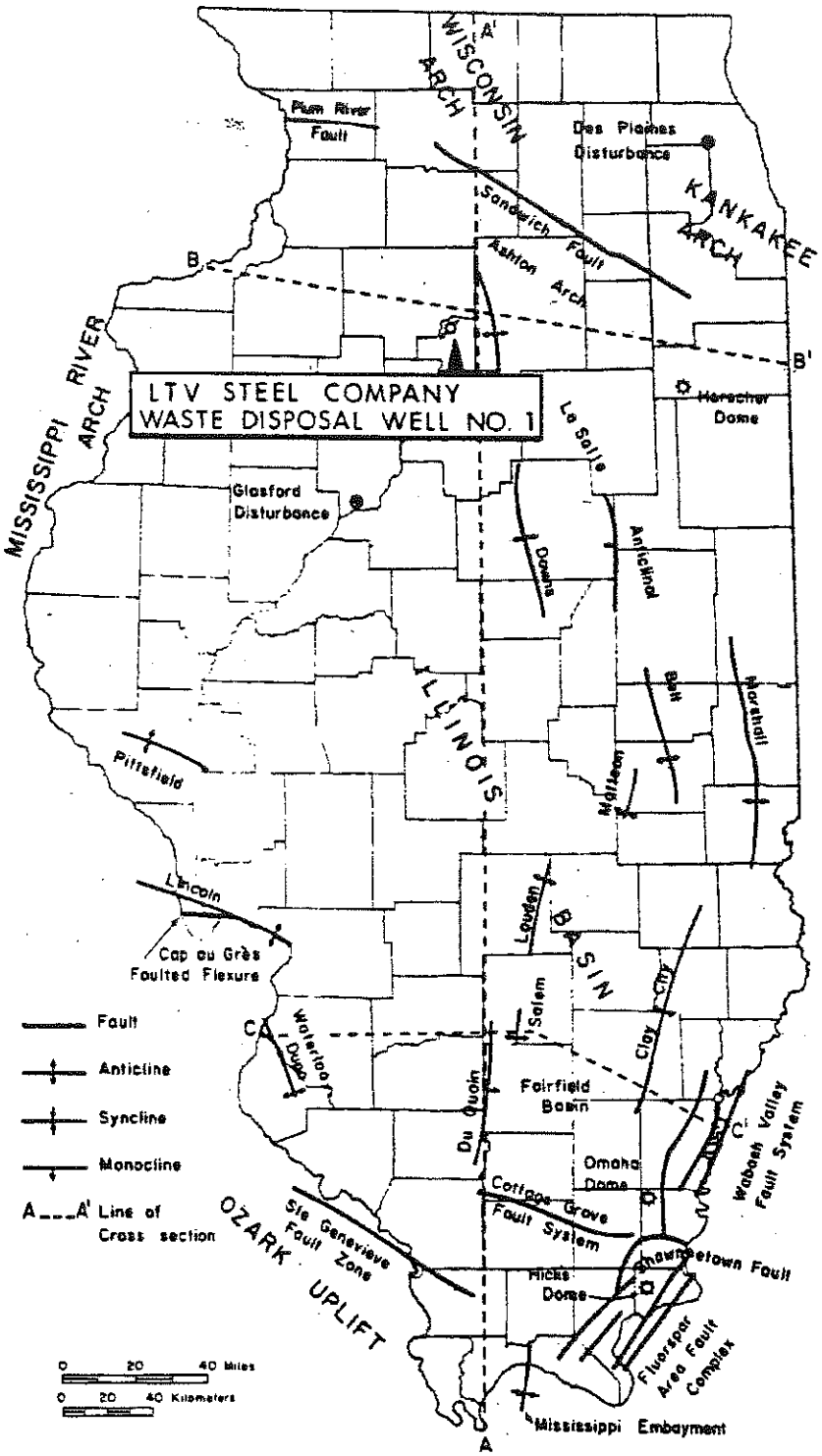
5.0 GEOLOGY

5.1 REGIONAL GEOLOGY AND TECTONICS

Putnam County is structurally located within a northwest - southeast trending depositional area known as the Illinois Basin. The Illinois basin contains dominately marine sedimentary sequences which range in thickness from 1500' to 15,000' from north to south.

The Illinois basin is a product of repeated tectonics over geologic time. The La Salle Anticlinal Belt is the dominant regional structure within the basin and has associated faults which cause varied relief. This structural lineament extends from La Salle County in north central Illinois, southeastward to Lawrence County near Vincennes, Indiana. The anticlines present within the belt are asymmetrical and possess a wide range in dip-locally up to 1000 feet/mile to the west and 100 feet/mile to the east. Other structural features include the Kankakee and Wisconsin Arches, several minor synclines, anticlines, domes and cryptoexplosion structures as illustrated in Figure 5.0-1.

Geological features closest to the study area are the Sandwich Fault and the Ashton Arch as seen in Figure 5.0-2. The Sandwich Fault Zone extends for 150 miles from south of Joliet to near Oregon. It is downthrown to the northeast with a maximum vertical displacement of more than 900' at its center according to McGinnis et al., 1976. Movement along this fault zone occurred after the Silurian and was most likely coincidental with movement along the La Salle Anticline in the Pennsylvanian and after.



Principal geologic structures of Illinois (modified from Willman et al., 1975).

FIGURE 5.0-1

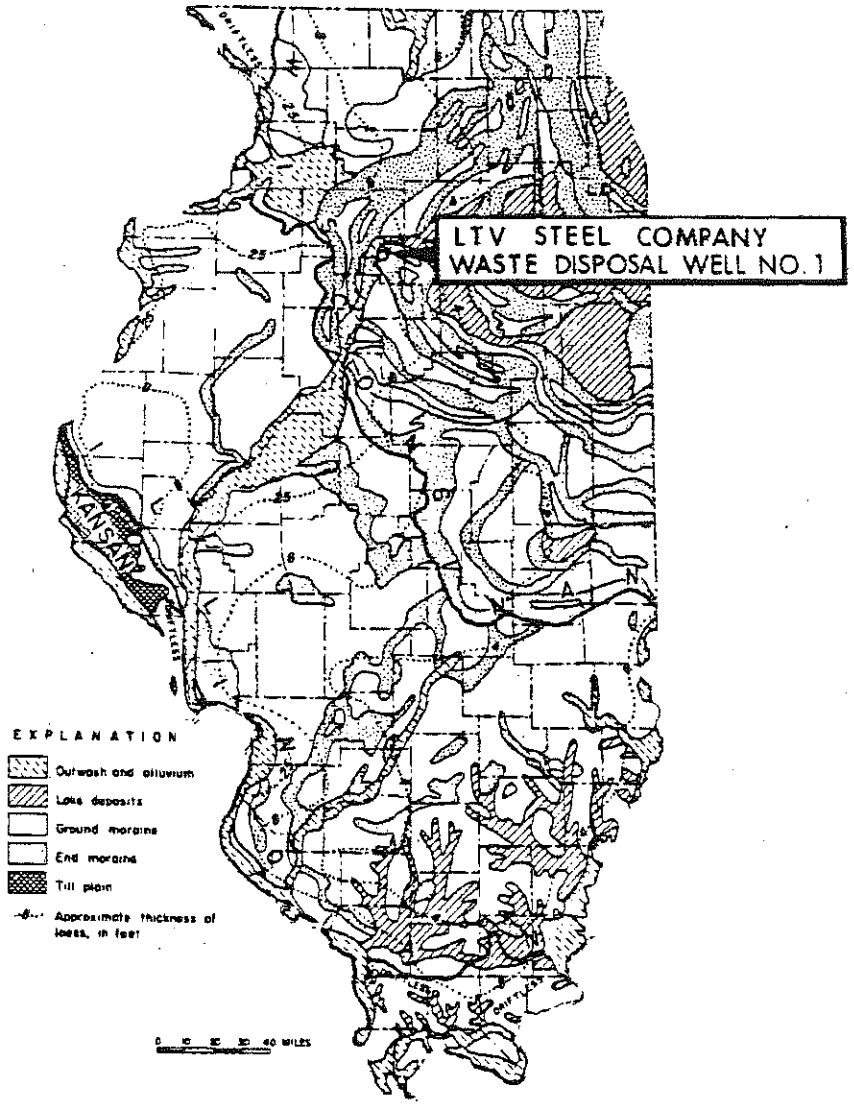
Local structural geologic features present are the Granville Basin, the Hennepin Syncline and the Depue and Cedar Point Anticlines.

5.2 LOCAL GEOLOGY - STRATIGRAPHY

In the vicinity of Hennepin Works, the surficial geology consists of unconsolidated Quaternary glacial deposits and sections of Palezoic bedrock exposed by the dissection of the Illinois river. Glacial deposits and generalized bedrock surface are shown in Figures 5.0-3 and 5.0-4 respectively,.

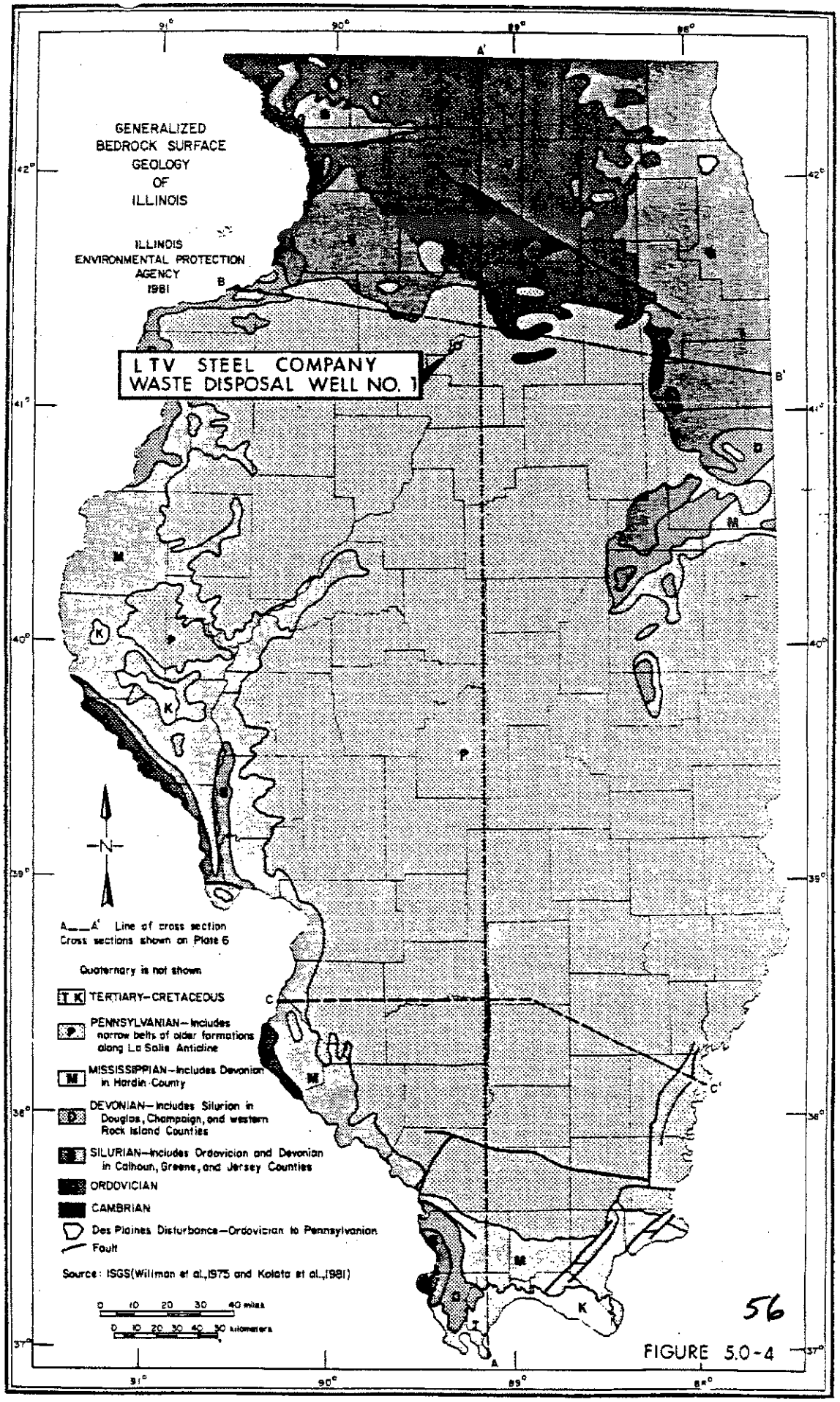
The subsurface geology at the plant site is described by using well log data and core analysis from Hennepin's waste disposal well No. 1 and information from the Handbook of Illinois Stratigraphy, (ISGS, 1975). A type log of the Eau Claire and Mt. Simon at the well's location is included as Figure 5.0-5 in addition to a generalized geologic column in Figure 5.0-6 to illustrate the stratigraphic relationships.

Precambrian Granite (4843'±) - The Precambrian Granite froms a non-conformable base upon which all sedimentary strata were deposited and is the oldest unit in the stratigraphic sequence.



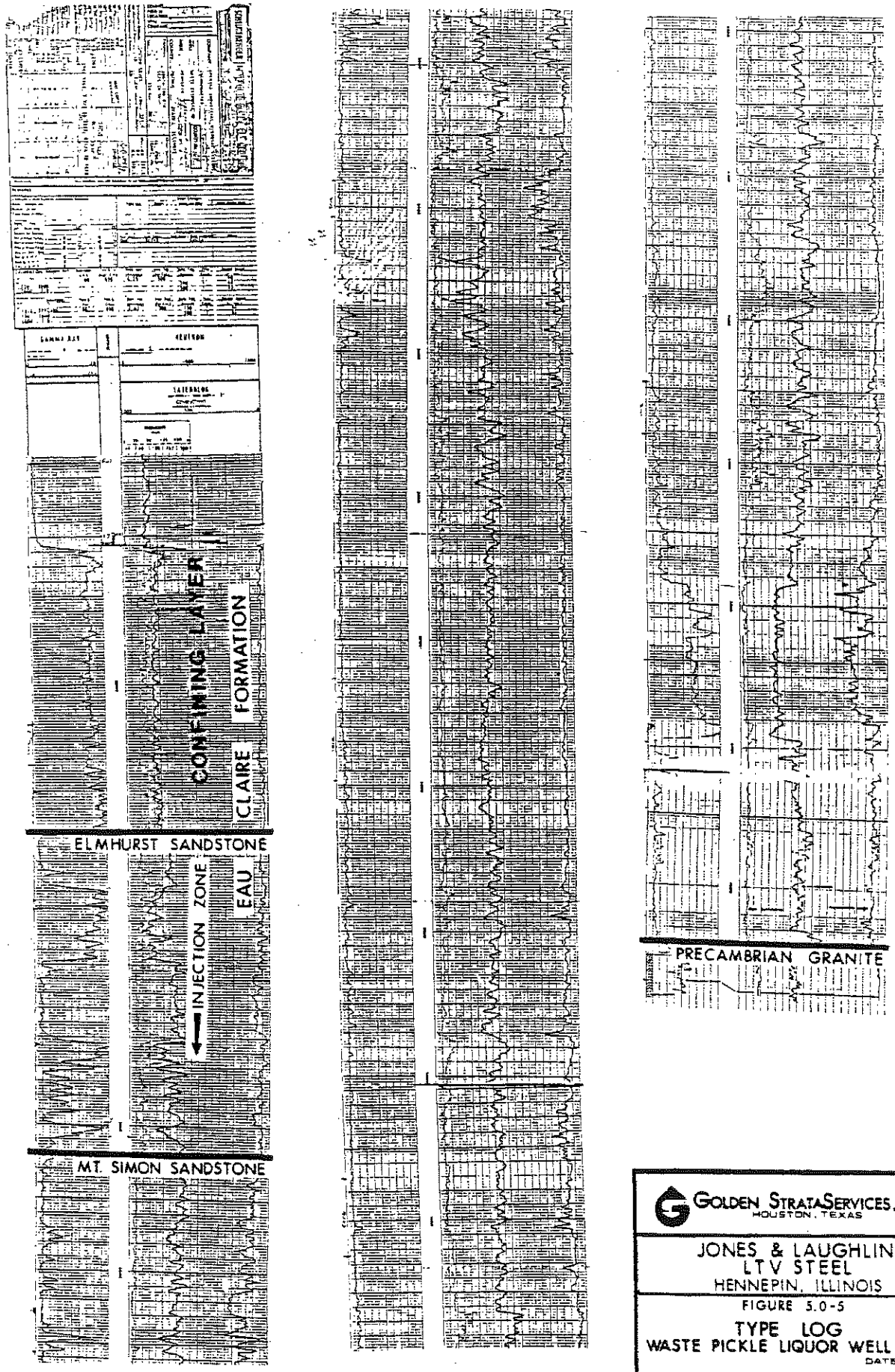
Glacial geology of Illinois (after Bergstrom et al., 1968).

FIGURE 5.0-3



56

FIGURE 5.0-4



GOLDEN STRATASERVICES, INC.
HOUSTON, TEXAS

JONES & LAUGHLIN
LTV STEEL
HENNEPIN, ILLINOIS

FIGURE 5.0-5

TYPE LOG
WASTE PICKLE LIQUOR WELL NO. 1

DATE: 12-84

SYSTEM	SERIES OR GROUP	FORMATION THICKNESS (FT.)	GRAPHIC LOG	ROCK TYPE (DRILLERS TERMS)	WATER-YIELDING CHARACTERISTICS; DRILLING AND WELL CONSTRUCTION DETAILS
	Pleistocene	0-500		Unconsolidated glacial deposits, alluvium and wind-blown silt (drift, surface, overburden)	Water-yielding character variable. Large yields from thicker sand and gravel deposits in bedrock valleys. Wells usually require screens and careful development. Chief aquifer in area
PENNSYLVANIAN	McLeansboro	0-1000		Mainly shale with thin limestone, sandstone and coal beds (Coal Measures)	Water-yielding character variable. Locally shallow sandstone and creviced limestone yield small supplies. Water quality usually becomes poorer with increasing depth. May require casing
	Carbondale	0-150			
	Tradewater Caseyville	0-600			
MISSISSIPPIAN	Chester	0-500		Limestone, sandstone and shale	Too deep to be considered as a source of groundwater in this area
	Valmeyer	Ste. Genevieve 0-120		Limestone	May be water-yielding in Mason county where these formations are present, at a shallow depth. In the rest of the area too deep to be considered as a source of groundwater
		St. Louis - Salem 0-270		Limestone	
		Warsaw 0-130		Shale	
		Keokuk - Burlington 0-300		Cherty limestone	
DEVONIAN	Kinderhook	0-200		Shale	Not water-yielding
		0-70		Limestone	Water-yielding from crevices where encountered at a shallow depth. In most of the area too deep to be considered as a source of groundwater
SILURIAN	Niagaran	0-350		Dolomite and limestone	
	Alexandrian	0-100			
ORDOVICIAN	Cincinnatian	Maquoketa 0-200		Shale with limestone and dolomite beds	Not water-yielding at most places; casing required
	Mohawkian	Galena-Platteville 300-430		Limestone and dolomite	Not important as aquifers. Creviced dolomite probably yields some water to wells drilled into underlying sandstone
	Chazy	Glenwood - St. Peter 150 - 300		Sandstone, clean, white, thin dolomite and shale at top (St. Peter)	Dependable source of groundwater in the northern part of the area. Water becomes highly mineralized with increasing depth
	Prairie Du Chien	Shakopee 200 - 410		Cherty dolomite thin beds of sandstone	Not important as aquifer. Liners in lower St. Peter sandstone are commonly seated in upper part of Shakopee
		New Richmond 0-175		Sandstone and dolomite	Not important as aquifers in this area
		Oneota 300-500		Dolomite with some sandstone beds (Lower magnesian)	
CAMBRIAN	St. Croixan	Trempealeau 200-250		Dolomite with some sandstone beds	Limestone and sandstone beds are water-yielding. Water highly mineralized or "brine" in most of the area. In the northern part, quality of water unknown
		Franconia 100 - 200		Sandstone, shale and dolomite	
		Ironton - Galesville 125 - 215		Sandstone, clean, white, thin dolomite bed at the top (Oresbach)	
		Eau Claire 350-500		Shale, dolomite and sandstone	
		Mt. Simon 1200 +		Sandstone, with thin red shale beds	
PRE-CAMBRIAN				Granite and other	Crystalline rocks extending to great depths

- Generalized column of rock formations in east-central Illinois.

FIGURE 5.0 - 6

(SELKREGG, 1958)

The general configuration of the Precambrian basement is illustrated in Figure 5.0-7. This structure contour map indicates that the basement is 2000' below the surface in northern Illinois to almost 14,000' in southern Illinois. Substantial local relief is present on the Precambrian surface (Atherton, 1971) and is evident as a controlling force in the subsequent deposition of the Mt. Simon Sandstone.

Cambrian Elmhurst - Mt. Simon Sandstone (2900'± - 4843'±), Thickness 1943' - The basal sedimentary sequence is the thick and extensive Mt. Simon Sandstone. The Mt. Simon Sandstone extends throughout Illinois and varies in thickness considerably from northeast to southwest. It ranges from 2500' thick in the northeastern portion of the state to less than 500' in the southwest as shown in thickness map, Figure 5.0-8. Several Precambrian highs are present which resulted in the non-deposition of the Mt. Simon in selected areas. The Mt. Simon is 1734' thick within the study area, does not outcrop and consists of fine to coarse grained, partly pebbley and friable sandstone.

Within the study area, the Elmhurst Sandstone, the lowermost member of the Eau Claire Formation is grouped with the Mt. Simon Sandstone because they are to considered hydraulically connected (Illinois Geological Survey, 1981). The Elmhurst Sandstone is fine to medium grained, fossiliferous and contains interbedded gray shale.

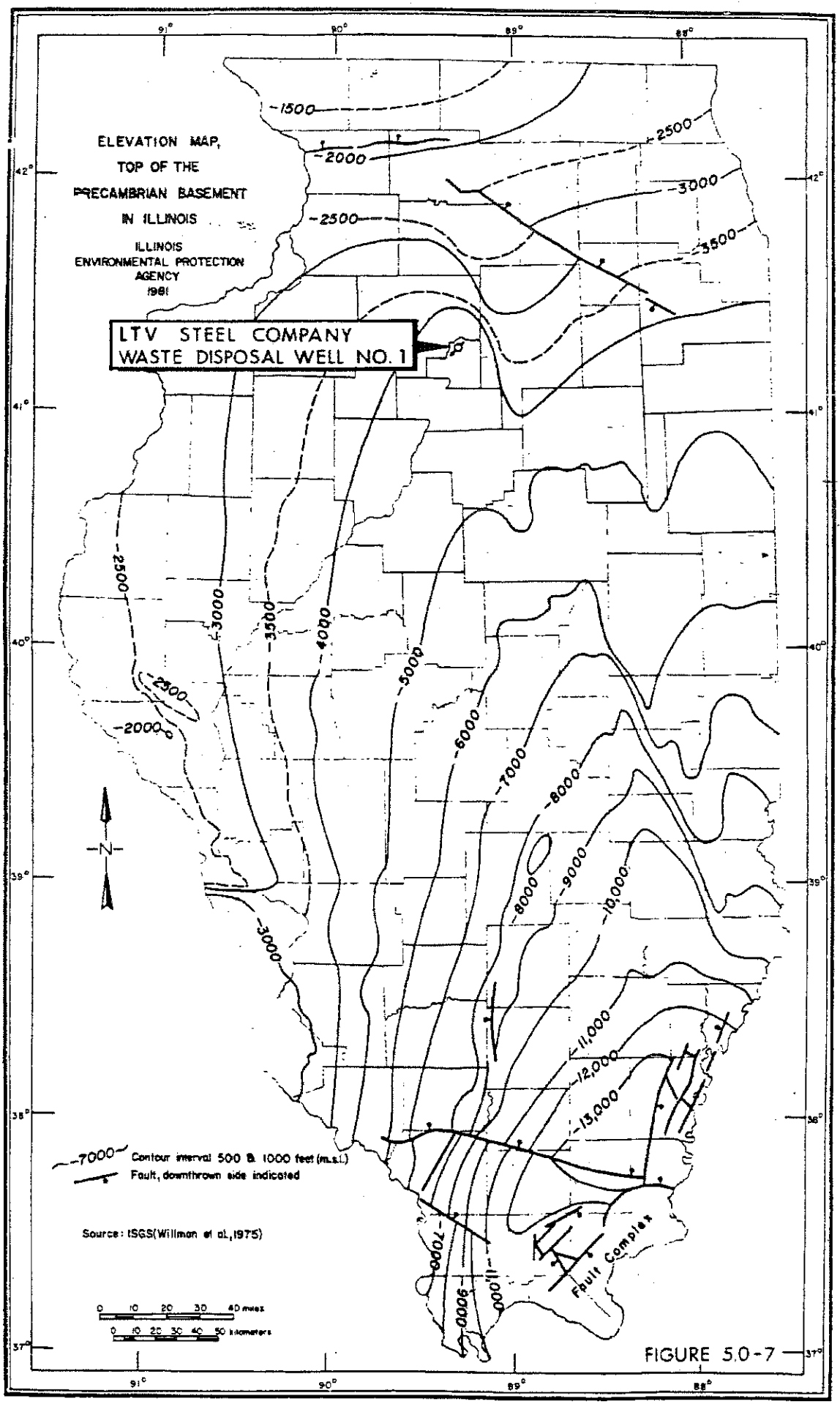

ELEVATION MAP,
TOP OF THE
PRECAMBRIAN BASEMENT
IN ILLINOIS
ILLINOIS
ENVIRONMENTAL PROTECTION
AGENCY
1981
LTV STEEL COMPANY
WASTE DISPOSAL WELL NO. 1
-1500
-2000
-2500
-3000
-3500
-4000
-5000
-6000
-7000
-8000
-9000
-10,000
-11,000
-12,000
-13,000
N
-7000 Contour interval 500 & 1000 feet (m.s.l.)
Fault, downthrown side indicated
Source: ISGS(Willman et al, 1975)
0 10 20 30 40 miles
0 10 20 30 40 50 kilometers
Fault Complex
91°
90°
89°
88°
42°
41°
40°
39°
38°
37°

FIGURE 5.0-7

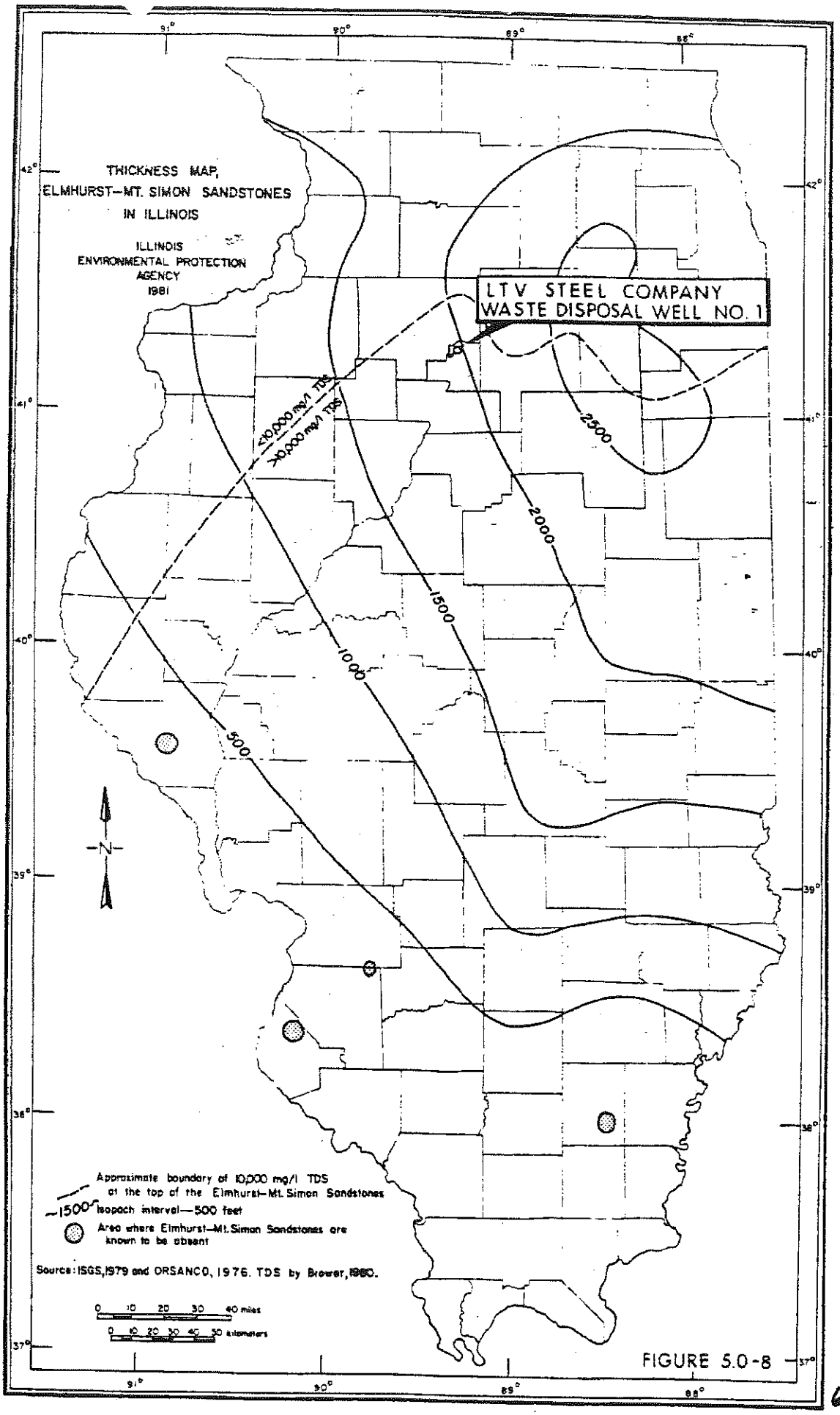

THICKNESS MAP,
ELMHURST–MT. SIMON SANDSTONES
IN ILLINOIS
ILLINOIS
ENVIRONMENTAL PROTECTION
AGENCY
1981
LTV STEEL COMPANY
WASTE DISPOSAL WELL NO. 1
<10,000 mg/l TDS
>10,000 mg/l TDS
500
1000
1500
2000
2500
N
Approximate boundary of 10,000 mg/l TDS at the top of the Elmhurst–Mt. Simon Sandstones
1500 Isopach interval—500 feet
Area where Elmhurst–Mt. Simon Sandstones are known to be absent
Source: ISGS, 1979 and ORSANCO, 1976. TDS by Brower, 1980.
0 10 20 30 40 miles
0 10 20 30 40 50 kilometers
91°
90°
89°
88°
42°
41°
40°
39°
38°
37°

FIGURE 5.0-8

A structure contour map depicting the top of the Elmhurst - Mt. Simon Sandstones is included as Figure 5.0-9. It also illustrates that the TDS level in the Elmhurst - Mt. Simon Sandstone aquifer is over 10,000 mg/L. Therefore both the Mt. Simon and Elmhurst sandstones are not considered USDWs within the study area where they are used as a waste disposal reservoir.

Cambrian Eau Claire Formation (2705'± - 2900'±) Thickness 195' - The Eau Claire Formation consists of shale, dolomite, shaley dolomite and sandstone. A basal sandstone member, the Elmhurst Sandstone, is grouped with the Mt. Simon Sandstone. The remainder of the Eau Claire Formation acts as an upper confining layer for the Elmhurst - Mt. Simon Sandstones. The thickness of the Eau Claire (including the Elmhurst Sandstone) varies from 300' to 1000'.

Cambrian Ironton - Galesville Sandstone (2535'± - 2705'±), Thickness 170' - The Galesville Sandstone consists of 40' - 100' of fine grained, moderately well sorted and friable sandstone. The Ironton ranges from 50' - 100' and is a relatively coarse grained sandstone. These sandstone units underlie all of the northern Illinois but are absent to the south. These units are utilized as Public Water Supply when the TDS content is acceptable. At the Hennepin Works, the TDS content of these units exceeds 10,000 mg/L and therefore these sandstones are not considered to be USDWs.

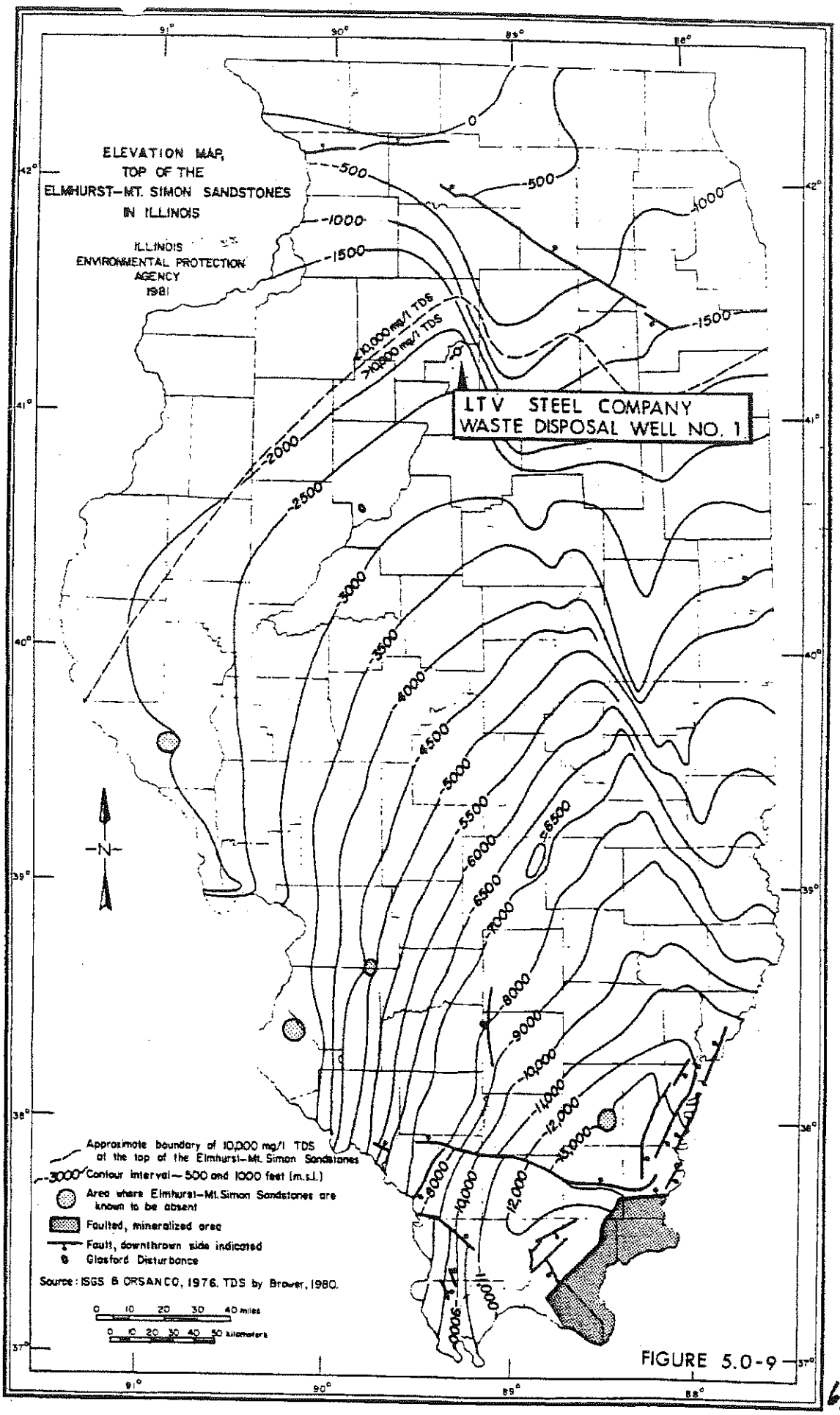

ELEVATION MAP,
TOP OF THE
ELMHURST–MT. SIMON SANDSTONES
IN ILLINOIS
ILLINOIS
ENVIRONMENTAL PROTECTION
AGENCY
1981
LTV STEEL COMPANY
WASTE DISPOSAL WELL NO. 1
<10,000 mg/l TDS
>10,000 mg/l TDS
Approximate boundary of 10,000 mg/l TDS at the top of the Elmhurst–Mt. Simon Sandstones
3000 Contour interval — 500 and 1000 feet (m.s.l.)
Area where Elmhurst–Mt. Simon Sandstones are known to be absent
Faulted, mineralized area
Fault, downthrown side indicated
Glasford Disturbance
Source: ISGS & ORSANCO, 1976. TDS by Brower, 1980.
0 10 20 30 40 miles
0 10 20 30 40 50 kilometers
N

FIGURE 5.0-9

Cambrian Franconia Formation (2380'± - 2535'±), Thickness 155' - The Franconia Formation consists of glaconitic, argillaceous sandstone and dolomite. South of the Sandwich Fault Zone, the Franconia becomes increasingly shaley and the uppermost portion grades to silty and sandy dolomite. The Franconia has limited utilization as an USDW in west central and northern half of Illinois.

Cambrian Eminence - Potosi Dolomites (2127'± - 2380'±), Thickness 253' - The basal Potosi Dolomite consists of finely crystalline, pure to slightly argillaceous dolomite. The overlying Eminence dolomite is sandy fine to medium grained dolomite with oolitic chert and interbedded sandstone. These dolomites are used for underground injection in the southern portion of Illinois. At Hennepin Works, these units are considered to be USDW's.

Ordovician Prairie du Chien Group (1592'± - 2127'±), Thickness 535' - The Prairie du Chien Group consists of cherty dolomite and interbedded sandstone. The group contains four formations; in descending order, the Shakopee Dolomite, New Richmond Sandstone, Oneota Dolomite and the Gunter Sandstone. This group is considered as USDW within the area of review.

Ordovician Glenwood - St. Peter (Ancell Group) Formations (1474'± - 1592'±), Thickness 118' - The Ancell Group includes the St. Peter Sandstone and the Glenwood Formation. The St. Peter Sandstone consists of fine to medium, well sorted and rounded, frosted quartz sand that is

weakly cemented. The overlying Glenwood Formation is composed of poorly sorted sandstone, impure dolomite and shale. The Ancell Group is an USDW within the vicinity of the Hennepin Works site.

Ordovician Galena - Platteville Group (1108'± - 1474'±), Thickness 366' - The Platteville Group includes dominately limestone formations which overlie the Glenwood formation and underlie the Galena Group. It is subdivided into the basal Pecatonica Formation, a vuggy dolomite and the Platten Subgroup, a dominately fine grained lithographic limestone.

The Galena Group (also known as the Trenton) consists of two subgroups - Decorah Subgroup (shale and limestone) and the Kimmswick Subgroup (limestone and dolomite). The Galena and Platteville Groups are considered to be USDW's within the study area.

Late Ordovician Maquoketa Shale Group (930'± - 1108'±), Thickness 178' - The Maquoketa Shale Group unconformably overlies the Galena - Platteville Group except in southwestern Illinois. The group includes a basal shale unit - the Scales Shale Formation, a middle member - the Fort Atkinson Limestone and an upper dolomitic shale - the Brainard Shale. It acts as a confining layer for underlying ground water and yields water only in northeastern Illinois.

Silurian - Devonian (Hunton Megagroup) (385'± - 930'±), Thickness 545' - The Hunton Megagroup consists of the carbonate sedimentary sequences of Silurian and Devonian age that in Illinois stratigraphically are between the Late Ordovician Maquoketa Shale Group and the late Devonian. The Silurian system includes the Alexandrian, the Niagaran and the Cayugan Series. The Devonian sequences are absent in northern Illinois but where present are dominately siliceous limestone, dolomite and chert.

Pennsylvanian System (175'± - 385'±), Thickness 210' - The Pennsylvanian System overlies Mississippian strata in southern and central Illinois and older strata in northern Illinois. The upper surface of the Pennsylvanian System was eroded and modified by Pleistocene glaciation and Holocene streams.

This system contains varied lithologies such as sandstone, siltstone, shale, limestone, coal and clay. It is considered an USDW within the study area.

Quaternary Pleistocene Glacial Deposists (0'± - 175'±) - The Pleistocene deposits consist of unconsolidated sediments whose lithology varies from boulders to clay. Glacial deposits overlie almost all bedrock sequences in Illinois. Thickness of these deposits range from 1' - 600'. They are 175' thick at the Hennepin Works site. Aquifers within the Quaternary system are capable of providing high yields of good quality water as discussed previously in Section 4.0.

5.3 STRUCTURAL GEOLOGY

Hennepin Works is located on the northern edge of the elliptically shaped Illinois basinal area. The gentle regional structural dip (20' per mile) of the major consolidated sedimentary sequences is to the southeast. Within the area of review, there are several minor geologic structures which do not appear to have a significant effect on the Elmhurst - Mt. Simon Sandstones within the study area. Regional geologic features have been discussed in Section 5.1.

The Elmhurst - Mt. Simon Sandstones are generally flat lying with a shallow dip of 28' per mile to the southeast. These sandstones are areally extensive and not bound by faulting or folding locally which might pose a constraint to waste disposal operations. In addition, the Elmhurst - Mt. Simon Sandstones are confined above by the shale units present in the regionally extensive Eau Claire Formation. Impermeable Precambrian bedrock serves as a lower confining layer and acted as structural control during the deposition of the basal sedimentary units. The influence of Precambrian bedrock configuration within the basinal area during the deposition of the Mt. Simon Sandstones is clearly evident in the structural contour map shown in Figure 5.0-9.

The thickness of the Elmhurst - Mt. Simon Sandstone varies significantly from 500' to 2500' as seen in thickness map, Figure 5.0-8. These sandstones combined thickness is over 1900' at Hennepin Works well No. 1.

5.4 CROSS SECTIONS

Regional Cross Sections included as Figure 5.0-10, illustrate the stratigraphic relationships of the major geologic units. The location of cross section lines are shown in Figure 5.0-4. Two cross sections are included to depict the stratigraphic relationships of the injection zone with its respective confining layers. The cross sections shown as Figures 5.0-11 and 5.0-12 illustrates that the Elmhurst - Mt. Simon Sandstone and their respective confining layers are areally extensive, locally flat lying and are not bound by geological constraints such as faulting or folding.

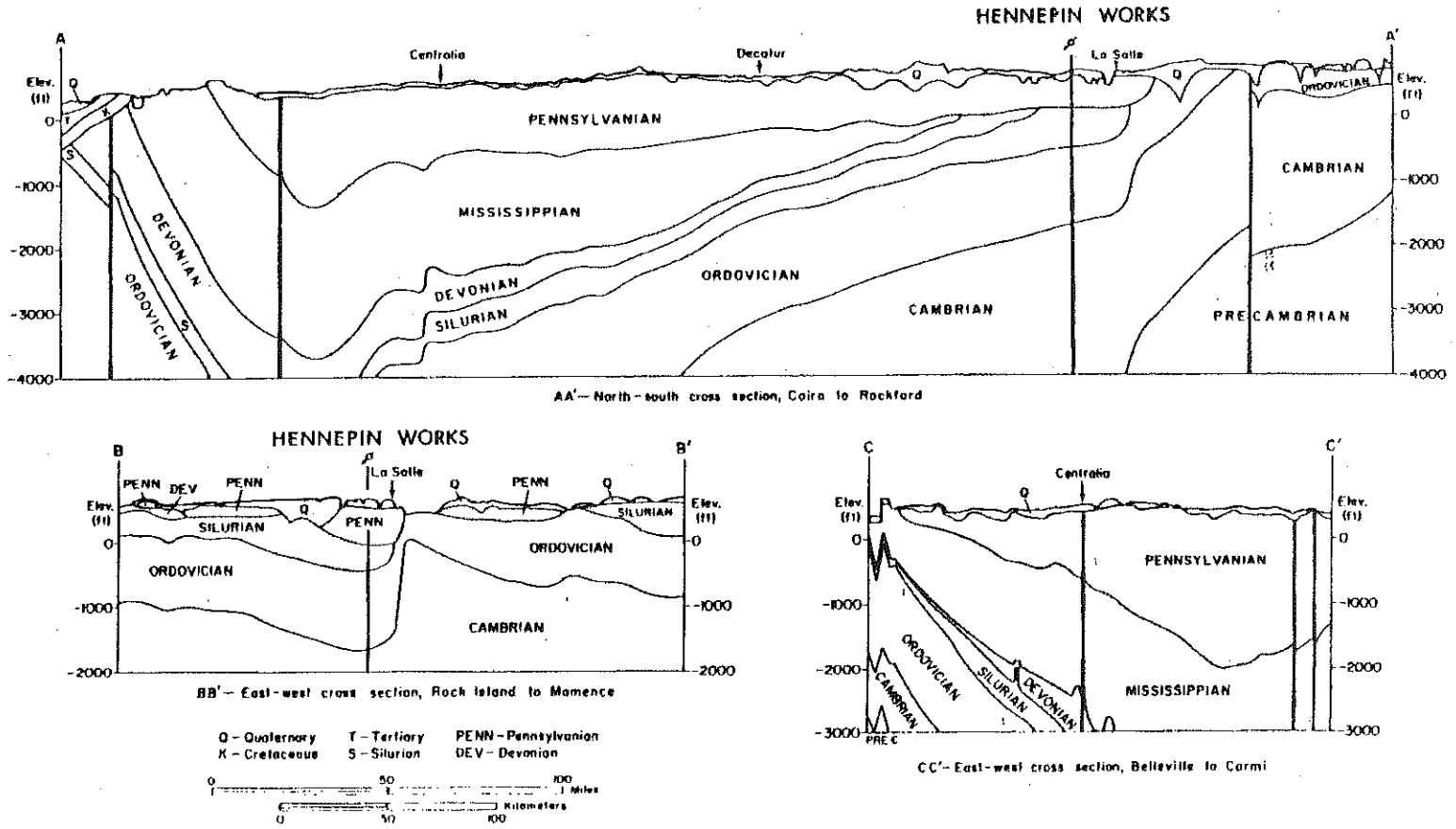
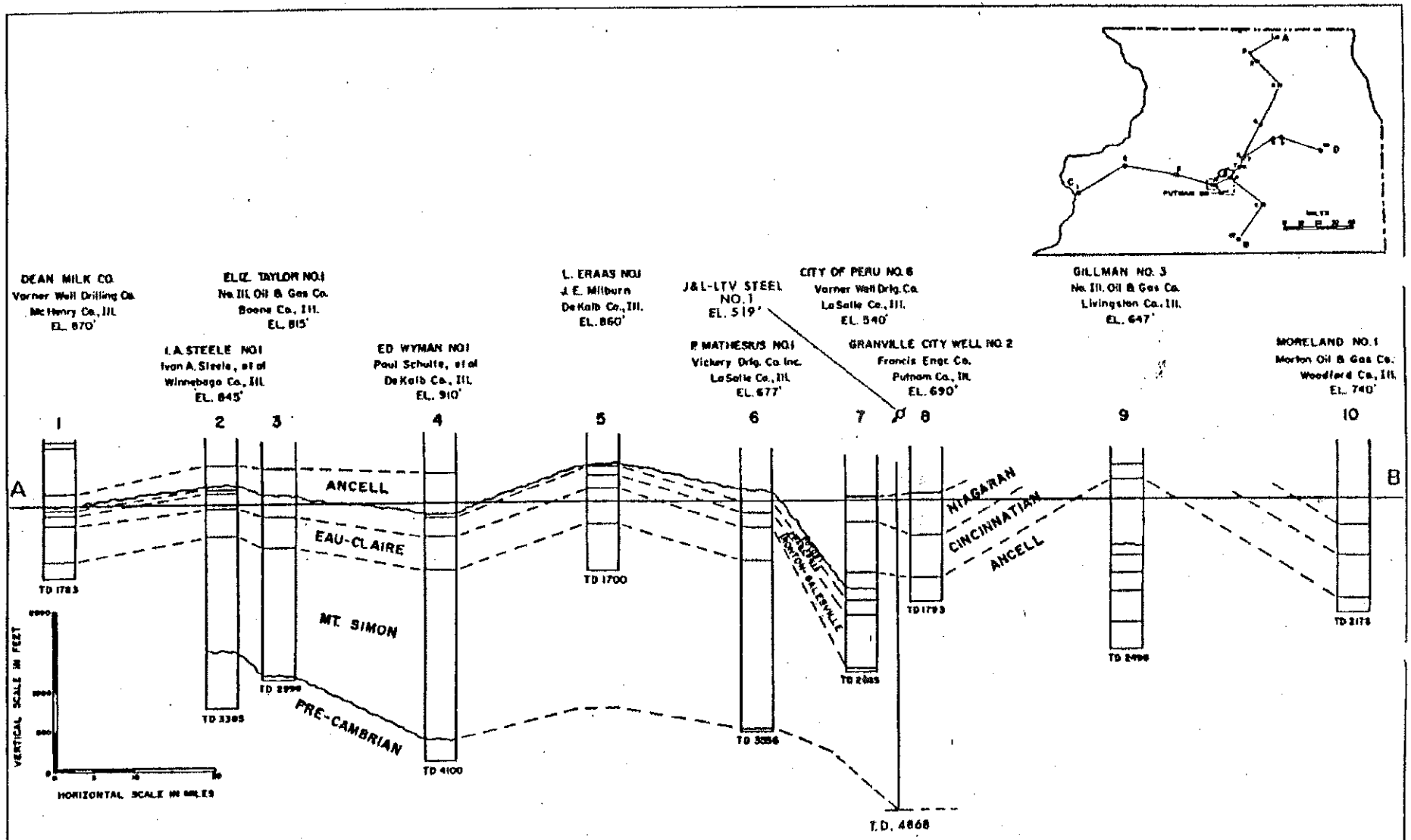


FIGURE 5.0-10

REGIONAL GEOLOGIC CROSS SECTION



(HUNTLEY & HUNTLEY, 1965)

FIGURE 5.0-11

GEOLOGIC CROSS SECTION A – B

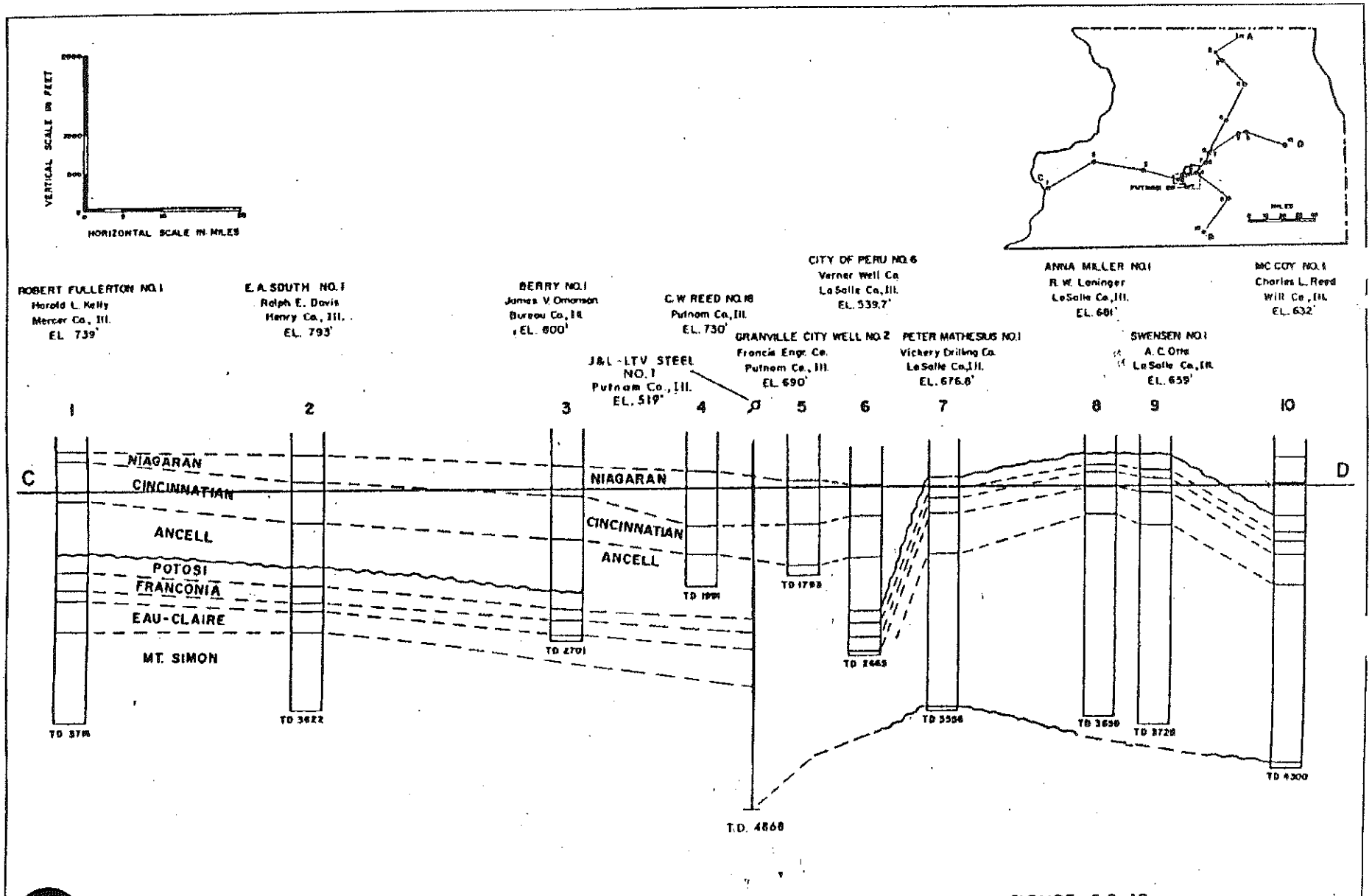


FIGURE 5.0-12

GEOLOGIC CROSS SECTION C-D

(HUNTLEY & HUNTLEY, 1965)

xc FOS + Region V → CINDY

LTV Steel Company
HENNEPIN WORKS

ILD 000 738 471

November 13, 1987

Illinois Environmental Protection Agency
Division of Land Pollution Control - #24
Compliance Monitoring Section
2200 Churchill Road
P.O. Box 19276
Springfield, Illinois 62794-9276

RE: Permit No. UIC-004-W1-JL

Enclosed is a "revised" copy of the September 1987 UIC Organic Scan Report for the Hennepin Works of LTV Steel Company. The original reported value for Herbicides was in error, as originally reported to us by our contract laboratory, because of failure to take into account the concentration factor for the calculation.

P.N. Schlingman, General Supervisor
Operations Support Services

R.V. Norell, Asst. Superintendent
Maintenance & Operations Support Services

cc: L.A. Szuhay
file

Illinois Environmental Protection Agency
Division of Land Pollution Control
Field Operations Section
4302 North Main Street
Rockford, Illinois 61103

Illinois State Geological Survey
Ground Water Section
Attention: Mr. Ross Brower
Natural Resources Building
615 East Peabody Drive
Champaign, Illinois 61820

Illinois State Water Survey
Ground Water Section
Attention: Mr. Adrian Visocky
2204 Griffith Drive
Champaign, Illinois 61820

RECEIVED
NOV 17 1987
IEPA/DLPC

LTV STEEL COMPANY
HENNEPIN, ILLINOIS 61327
DEEP WELL INJECTION ANALYSES

"REVISION"

Permit Nos.: #UIC-004-W1-JL
IEPA #1558010006 Putnam County
USEPA #ILD000781591

Reporting Period 09/01/87 - 09/30/87

WEEK		09/20 - 09/26
	Dissolved Solids (mg/l)	
	Total Iron (mg/l)	
	Hex Chrome (mg/l	
W	% Acid	
E	pH (units)	
E	Chloride (mg/l)	
K	Spec. Gravity	
L	Viscosity (SSU)	
Y	Sample Temperature (°F)	
	Collect Temperature (°F)	
	Sulfate (mg/l)	
	Nickel (mg/l)	
	Zinc (mg/l)	
M	Arsenic (mg/l)	
O	Cadmium (mg/l)	
N	Silver (mg/l)	
T	Selenium (mg/l)	
H	Phenols (mg/l)	
L	Total Organic Content (TOC)	
Y	Total Organic Halogen (TOX)%	
	Organic Scan:	
Q	1. Volatiles (organic)	< 0.001 PPM
R	2. Acid	< 0.015 PPM
T	3. Base & Neutrals	< 0.03 PPM
L	4. PCB's & Pesticides	< 0.08 PPB
Y	5. Herbicides	< 0.003 PPM*

* REVISED 11/13/87

SIGNED R. Schlueman

RECEIVED
NOV 17 1987
IEPA/DLPC

UTIL2

XC to Reg V
Cindy Davis
then to MI

LTV Steel Company
HENNEPIN WORKS

July 31, 1987

Harry A. Chappel, P.E., Acting Manager
Facilities Compliance Unit
Compliance Monitoring Section
Illinois Environmental Protection Agency
Division of Land Pollution Control
2200 Churchill Road
Post Office Box 19276
Springfield, Illinois 62794-9276

Dear Mr. Chappel

Our response to your letter dated July 16, 1987, paragraphs No. 1 and 2 of attachment "A" have been made by our Mr. Lee E. Larson under separate copy.

In response to your paragraph No. 3, attachment "A" of the subject letter, efforts to reduce the volume and toxicity of spent pickle liquor generated at the subject facility include the following:

- o implementation of Integrated Process Control (IPC) techniques to identify and maintain optimum operating parameters in the interest of minimizing pickle liquor usage and maximizing product quality.

- o on-going evaluation of economically practicable methods of usage, storage and disposal of waste to minimize threat to human health and the environment.

Although LTV Steel's efforts may be nearing the lower limit of technical feasibility in terms of quantity/concentration of pickle liquor required - which directly influences the quantity/toxicity of spent pickle liquor generated - the efforts previously described have reduced the quantity of spent pickle liquor are shown in the following table:

Year	Spent Pickle Liquor gal/ton*
1986	6.7
1985	7.2
1984	7.2

Further efforts in this area are expected.

In response to paragraph No. 4 of attachment "A" of the subject letter, I contacted your representative Mr. David S. Retzlaff and discussed with him what he believed to be an omission of our contingency plan submittal to the local agencies. Mr. Retzlaff apparently overlooked our record of this submittal during his inspection and I have mailed to him a copy of this submittal which was made back in 1980 and I believe that he now feels that this requirement is indeed satisfied.

If you have any further questions concerning these items, please call me at Area Code 815-925-2133.

P.N. Schlingman, General Supervisor
Utilities and Environment

/ch
UTIL5

cc: L.A. Szuhay
R.A. Voytko
T.A. Zalenski
L.E. Larson
file

LTV Steel Company
I + L Steel

November 11, 1986

Illinois Environmental Protection Agency
Division of Water Pollution Control
2200 Churchill Road
Springfield, Illinois 62706
Att: Compliance Assurance Section

RE: Permit No. IL0002631

Enclosed is the October 1986 Discharge Monitoring Report for the Hennepin Works of the LTV Steel Company.

P.N. Schlingman, General Supervisor
Combustion and Utilities

W.C. Krapf, Superintendent
Central Maintenance and Utilities

cc: L.A. Szuhay
L. Wisniewski
file

Illinois Environmental Protection Agency
Rockford Region
Post Office Box 915
4302 North Main
Rockford, Illinois 61105

NPDES Compliance Unit
U.S. Environmental Protection Agency
Region V
230 South Dearborn Street
Chicago, Illinois 60604

cc: Deep Well Only

Illinois State Water Survey
2204 Griffith Drive
Champaign, Illinois 61820

Illinois State Geological Survey
Natural Resources Building
615 East Peabody Drive
Champaign, Illinois 61820

Illinois Environmental Protection Agency
Compliance Management Section (#24)
Division of Land Pollution Control
2200 Churchill Road
Springfield, Illinois 62706
Attention: Bur Filson

RECEIVED
NOV 18 1986
IEPA-DLPC

MONTHLY INJECTION DATA

WELL: LTV Steel Company

Month October 1986

DATE	HOURS	GAL.WASTE MAX.	GAL.WASTE MIN.	GAL.WATER MAX.	GAL.WATER MIN.	GAL.TREAT. MAX.	GAL.TREAT. MIN.	INJECTION PRESS MAX.	INJECTION PRESS MIN.	FLOW MAX.	FLOW MIN.	ANNULUS PSIG MAX.	ANNULUS PSIG MIN.
10/1								29	16			43	33
10/2								16	8			33	23
10/3								19	16			35	33
10/4								19	19			35	35
10/5	19.42	213900	0	19280	0	953	0	95	0	255	103	248	35
10/6	3.25	0	0	0	0	4063	0	62	34			73	45
10/7								34	23			45	34
10/8								23	9			34	20
10/9								23	19			33	33
10/10								24	23			35	33
10/11								24	24			37	35
10/12	15.25	144000	0	14800	0	6588	0	98	0	245	217	238	35
10/13								37	29			53	43
10/14								29	9			43	23
10/15								17	9			32	23
10/16								19	17			33	32
10/17								20	19			35	33
10/18								20	20			33	28
10/19	20.43	182200	0	15345	0	6264	0	90	0	230	152	225	28
10/20								44	31			57	43
10/21								31	15			43	27
10/22								18	8			30	23
10/23								20	18			33	30
10/24								21	20			33	33
10/25								22	21			35	33
10/26	17.08	172300	0	15538	0	5855	0	95	0	255	190	232	35
10/27								41	30			53	43

MONTHLY INJECTION DATA

WELL: LTV Steel Company

Month October 1986

DATE	HOURS	GAL.WASTE MAX.	GAL.WASTE MIN.	GAL.WATER MAX.	GAL.WATER MIN.	GAL.TREAT. MAX.	GAL.TREAT. MIN.	INJECTION PRESS MAX.	INJECTION PRESS MIN.	FLOW MAX.	FLOW MIN.	ANNULUS PSIG MAX.	ANNULUS PSIG MIN.
10/28								29	7			43	20
10/29								17	7			25	20
10/30								19	17			32	25
10/31								20	19			27	25

MONTHLY AVE.	178105	0	16261	0	5931	0
MONTHLY TOTAL	712420		65043		23723	
MONTHLY GRAND TOTAL			801186			
CUMULATIVE VOL.			135,141,683			

SIGNED P. M. Schlagenhauf

	MONTHLY Ave.	Max.	Min.
Inj. Press. PSI	25	98	0
Inj. Flow GPM	206	255	103
Annulus Press. PSI	47	248	20
Vol. (gal.) WASTE	178105	213900	0
Vol. (gal.) WATER	16261	19280	0
Vol. (gal.) TREAT.	5931	6588	0

LTV STEEL COMPANY

(JONES AND LAUGHLIN STEEL CORPORATION)

HENNEPIN, ILLINOIS 61327

DEEP WELL INJECTION ANALYSES

Permit No.: 0002631

Discharge: 003

Reporting Period 10/01/86 - 10/31/86

	09/28 -	10/05 -	10/12 -	10/19 -
WEEK	10/04	10/11	10/18	10/25
Dissolved Solids (mg/l)	312,100	322,768	300,336	320,116
Total Iron (mg/l)	126,221	126,221	121,753	128,455
Hex Chrome(mg/l	0.08	0.05	0.08	0.16
% Acid	2.55	2.77	2.19	2.56
pH (units	0	0	0	0
Chloride (mg/l)	209,661	211,880	198,481	213,751
Spec. Gravity	1.2423	1.2405	1.2402	1.2420
Viscosity (SSU	160	171	163	165
Sample Temperature	73	74	75	64
Collect Temperature	98	94	85	85

REMARKS:

SIGNED P H Schlemmer

UTIL2

RECEIVED

NOV 18 1986

IEPA-DLP